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| EXAMINER | |
|---|---|
| WANG, QUAN ZHEN | |

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| 2633 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/030,357 | GREEN ET AL. | |
| | Examiner | Art Unit | |
| | Quan-Zhen Wang | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 May 0602*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *47-114* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47-114* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/8/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 47-59, 63-96, 100-114 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gould et al. (U.S. Patent US 4,777,660) in view of Takamatsu (U.S. Patent US 5,822,099).

Regarding claims 47, 84, 108-109, Gould teaches an optical signaling system comprising first and second signaling devices (figs. 2-4 and 1), the first signaling device (figs. 2-4, assembly 40) comprising means for receiving an optical signal (figs. 2 and 3, window 46) transmitted from the second signaling device; and means for modulating the received optical signal (figs. 2-4, modulator; column 4, lines 54-58) with modulation data for the second signaling device and for reflecting (figs. 2-4, reflector 48) the received signal back to the second signaling device; and the second signaling device (fig. 1) comprising: means for generating an optical signal (fig. 1, laser 12); means for outputting the optical signal toward the first signaling device (fig. 1, mirrors 18, 19, 24, 26, 25, and beam splitter 22); means for receiving the reflected optical signal (fig. 1, mirrors 25, 26, and 24) from the first signaling device carrying the modulated data; and

means for retrieving the modulation data from the reflected signal (fig. 1, detector 28). Gould further teaches means for controllably steering the optical signal generated by the generating means towards the first signaling device (fig. 1, mirror 25) and means for sensing the signal strength of the reflected signal (fig. 1, detector 28). Gould differs from the claimed invention in that Gould does not specifically teach that means for controlling the steering means in dependence upon the sensed signal strength. However, it is well known in the art to controlling the steering means in dependence upon the sensed signal strength. For example, Takamatsu teaches to use the received signal strength to control the transmitted beam direction (fig. 4 and column 6, lines 48-67). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate the teachings of Takamatsu into the system of Gould in order to maximize the received signal strength reflected from the first signaling device.

Regarding claims 48 and 85, Gould further teaches that the steering means comprising means for reflecting the optical signal (fig. 1, mirror 25).

Regarding claims 49 and 86, Gould further teaches that the steering means comprises one mirror (fig. 1, 25) pivotally mounted relative to the generated optical signal.

Regarding claims 50 and 87, Gould further teaches that the steering means comprises means for diffracting the generated optical signal (fig. 1, element 20).

Regarding claims 51 and 88, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach

the diffraction means comprises a diffraction grating. However, it is well known in the art that a diffractive grating can be used to diffract an optical beam. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a diffractive grating in the system of Gould and Takamatsu in order to expand the beam size of the generated optical signal.

Regarding claims 52-53 and 89-90, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach the diffraction means comprises a hologram and the hologram is movable. However, it is well known in the art that a hologram can be used to diffract an optical beam, and it is well known in the art that an optical beam can be steered by moving the diffractive hologram. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a movable hologram in the system of Gould and Takamatsu in order to expand the beam size of the generated optical signal and steer the direction of the optical signal.

Regarding claims 54 and 91, Gould further teaches that the steering means comprises means for reflecting the generated optical signal (fig. 1, mirror 25).

Regarding claims 55-56, 92-93, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach the reflecting means comprises first and second prisms and steering the generated signal by rotating the prisms relative to the generated signal. However, a prism is one of the essential optical components used to reflect and diffract an optical signal beam, and it is well known in the art to change the direction of an optical signal by rotating a

prism relative to the signal source. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate two prisms in the system of Gould and Takamatsu and configure to rotate the prisms relative to the generated optical signal in order to change the direction of the generated optical signal.

Regarding claims 57 and 94, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the first and second prisms are rotatable about the axis of the generated optical signal and the steering means is operable to rotate the two prisms in opposite direction to steer the generated optical signal in a first direction and in operable to rotate the first and second prisms in the same direction to steer the generated optical signal in a second direction. However, it is well known in the art to rotate to prisms to change direction of an optical signal. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to rotate the two prisms in order to order to steer the generated optical signal.

Regarding claims 58 and 95, it is obvious that a prism is wedge shaped.

Regarding claims 59 and 96, Takamatsu teaches that the sensor is operable to monitor the signal strength of the reflected optical signal and the controller is operable to control the steering means in dependence upon the monitored signal level (fig. 4, column 7, lines 39-44).

Regarding claims 63 and 100, a microprocessor is well known in the art, therefore, it would have been obvious for one of ordinary skill in the art at the time when

the invention was made to incorporate a microprocessor in the controller in order to automate the control process.

Regarding to claims 64 and 101, Gould further teaches that the signal generator is operable to generate an optical signal at a fist power level. The modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the second signaling device further comprises a power controller operable to reduce the power output of the signal generator to a second power level in dependence upon the signal of the reflected signal sensed by the sensor. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a power control means into the modified system of Gould and Takamatsu for reducing the power output of the generating means to a second lower power level if the receiver senses signal strength exceeding a predetermined threshold in order to reduce the power consumption of the signal generating means.

Regarding claims 65 and 102, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the sensing means is operable to monitor a recent history of the received signal level and the power control means is operable to reduce the power output of the generating means in dependence upon the recent history. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to monitor a recent history of the received signal level in order to determine if the strength of optical signal received by the receiver exceeds a predetermined threshold; and to

reduce the power output of the generating means in the event that received signal strength exceeds a predetermined threshold in order to reduce the power consumption of the signal generating means.

Regarding claims 66 and 103, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the sensing means is operable to sense the level of the reflected signal at regular intervals and the power control means is operable to reduce the power output of the generating means of the change in signal level between sensing intervals exceeds a predetermined threshold. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to sense the level of the reflected signal at regular intervals in order to determine if the strength of optical signal received by the receiver exceeds a predetermined threshold.

Regarding claims 67 and 104, a stepper motor is well known in the art for controlling a steerer. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a microprocessor in the controller in order to automate the control process.

Regarding claims 68-70, Gould further teaches that the first signaling device further comprises a focusing device operable to focus the received optical signal onto the reflector (column 10, lines 48-51). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a focusing device and operable to focus the received optical signal onto the reflector in the first signaling device.

Regarding claim 69-70, Gould further teaches that the focusing device is a telescope mirror (column 10lines 48-51). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to change the design and use wide angle telescope lens in order to focus the received optical signal onto the reflector.

Regarding claim 71, Gould further teaches that the modulator is transmissive (fig. 2, 52), and it would have been obvious for one of ordinary skill in the art at the time when the invention was made to located the modulator between the focusing device and reflector.

Regarding claim 72, Gould further teaches that the modulator and the reflector are co-located (fig. 2, modulator 52 and reflector 48).

Regarding claim 73, Gould further teaches that the modulator and the reflector are separate elements (fig. 2, modulator 52 and reflector 48).

Regarding claims 74-77, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the first signaling device comprises a plurality of modulators operable to modulate and reflect optical signals received from a plurality of second signaling devices. It would have been obvious to one having ordinary skill in the art at the time the invention was made to (describe modification), since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.*

Regarding claim 78, Gould further teaches that the reflector is a retro-reflector (column 1, lines 29-39).

Regarding claim 79, Gould further teaches that the modulator modulates the amplitude of the received light (column 2, lines 65-68 and column 3, lines 1-2).

Regarding claim 80, Gould further teaches that the modulator comprises a quantum confined stark effect device (column 2, lines 57-64).

Regarding claim 81, Gould further teaches that the second signaling device is operable to transmit a message to the first signaling device and wherein the first signaling device comprises an information retriever operable to retrieve the message form the received signal (column 1, lines 29-39).

Regarding claims 82 and 105, Gould further teaches that signal generator comprises a laser (fig. 1, CO2 laser).

Regarding claims 83 and 106, Gould further teaches that the second signaling device further comprises an optical beam expander for increase the diameter of the optical signal output towards the first signaling device (fig. 1, lens 20 and mirrors 24 and 26).

Regarding claim 107, Gould further teaches a signaling kit comprising one first signaling device and one second signaling device (figs. 1 and 2).

Regarding claim 110, Gould and Takamatsu have been discussed above in regard with claims 47, 84, and 109-110. The modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach a power control means for reducing the power output of the generating means to a

second lower power level in dependence upon the sensed signal strength. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a power control means into the modified system of Gould and Takamatsu for reducing the power output of the generating means to a second lower power level if the receiver senses signal strength exceeding a predetermined threshold in order to reduce the power consumption of the signal generating means.

Regarding claim 111, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the sensing means is operable to monitor a recent history of the received signal level and the power control means is operable to reduce the power output of the generating means in dependence upon the recent history. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to monitor a recent history of the received signal level in order to determine if the strength of optical signal received by the receiver exceeds a predetermined threshold; and to reduce the power output of the generating means in the event that received signal strength exceeds a predetermined threshold in order to reduce the power consumption of the signal generating means.

Regarding claim 112, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the sensing means is operable to sense the level of the reflected signal at regular intervals and the power control means is operable to reduce the power output of the generating

means of the change in signal level between sensing intervals exceeds a predetermined threshold. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to sense the level of the reflected signal at regular intervals in order to determine if the strength of optical signal received by the receiver exceeds a predetermined threshold.

Regarding claim 113, Gould further teaches a data (information) distribution system comprising one signaling system according to claim 47 (figs. 1 and 2).

Regarding claim 114, Gould further teaches a data (information) distribution system comprising one signaling system according to claim 110 (figs. 1 and 2).

3. Claims 60-61, and 97-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gould et al. (U.S. Patent US 4,777,660) in view of Takamatsu (U.S. Patent US 5,822,099) and further in view of Rice (U.S. Patent US 5347387).

Regarding claims 60 and 97, the modified system of Gould and Takamatsu differs from the claimed invention in that Gould and Takamatsu do not specifically teach that the controller is operable to oscillate the steerer, and the senor is operable to sense a variation in the signal strength caused by the oscillation and wherein the controller is operable to control the steerer in dependence upon the sensed variation. However, Rice teaches a method to keep transceiver to remain in alignment when the carrier has a wide range vibration (column 8, lines 14-23). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate the method taught by Rice into the modified system of Gould and

Takamatsu and configure the controller to oscillate the steerer and the sensor to sense a variation in the signal strength caused by the oscillation and cause the controller to control the steerer in dependence upon the sensed variation in order to keep the transceiver in alignment.

Regarding claims 61 and 98, the modified systems of Gould, Takamatsu, and Rice differs from the claimed invention in that Gould, Takamatsu, and Rice do not specifically teach that the sensor comprises a phase sensitive amplitude modulation detector. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a sensor comprises a phase sensitive amplitude modulation detector into the modified systems of Gould, Takamatsu, and Rice in order to detect the variation of the signal strength.

4. Claims 62 and 99 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gould et al. (U.S. Patent US 4,777,660) in view of Takamatsu (U.S. Patent US 5,822,099) and further in view of Rice (U.S. Patent US 5347387) and further in view of Olson (U.S. Patent US 3,673,412).

Regarding claims 62 and 99, the modified systems of Gould, Takamatsu, and Rice differs from the claimed invention in that Gould, Takamatsu, and Rice do not specifically teach that the controller is operable to oscillate the steerer in accordance with at least one dither signal and the detector comprises a mixer to mix the reflected signal with at least one dither signal. However, it is well known in the art to use a dither signal. For example, Olson teaches to use a dither signal to oscillate a focusing mirror

(column 10, lines 18-28). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a dither signal, as it is used by Olson, into the modified system of Gould, Takamatsu, and Rice to oscillate the steerer.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Orino (U.S. Patent US 5,689,354) teaches an optical space communication apparatus. Green et al. (WO 98/35328) disclose a signaling system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw
4/30/05

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